Revolution of Self-Fertilizing Crops: Novel Transformation of IFS1 and IFS2 Genes Using Binary Vector for the Stimulation of a Symbiotic Bond Between B. japonicum and Host Plant

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The system of agriculture is inefficient. Agriculture follows the trend of adding artificial fertilizers to increase plant growth. This fertilizer is inadvertently destroying river ecosystems with algal blooms and costing the world a fortune. The answer to this problem is Rhizobium. Rhizobium is a naturally occurring microorganism that forms a symbiotic relationship with legume plants. It's nitrogen fixating capabilities fertilize the crop and increase their crop yield per acre. This relationship is triggered by the release of a chemical attractant from the legume plant. If a subsequent non-legume plant was able to produce this chemical attractant, it would result in a symbiotic relationship with Rhizobium. The chemical attractant used to stimulate the symbiotic bond in Glycine max (soybeans) is isoflavonoid genistein. Isoflavonoid genistein has been shown to reduce the chance of breast cancer, prostate cancer, and heart attacks and also strengthen bones. This project entails the transformation of two enzyme intermediaries IFS1 and IFS2, used in the production of isoflavonoid genistein into a host non-leguminous plant. This genetic enhancement of crops worldwide would change the world. Poverty and deforestation would diminish because Rhizobium can turn barren land into arable land. Fifty to sixty percent of fertilizers are made of nitrogen. By 2040, 1.29 trillion dollars would be saved globally. Self fertilizing crops would fulfill the demands of overpopulation. Self-fertilizing crops would fix the inefficiency of agriculture.